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Purdue University

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Thesis  
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UNIVERSITY OF PURDUE

1931

I wish to express my sincere appreciation to Professor  
A. H. Hines for his guidance and assistance in conducting  
this study, and to Mr. W. L. Harrison for his assistance  
in the statistical analysis. I also wish to thank the many  
persons who gave up their hours of spare time to assist

**DETERMINATION OF THE EFFECT OF PERFORMING A SIMPLE TASK OVER  
A PROLONGED PERIOD ON THE RATE OF ENERGY EXPENDITURE**

**A Thesis**

**Submitted to the Faculty**

**of**

**Purdue University**

**by**

**John Henry Behl**

**In Partial Fulfillment of the**

**Requirements for the Degree**

**of**

**Master of Science in Industrial Engineering**

**June, 1931**



Thesis  
B353

RESEARCHES ON THE EFFECT OF TEMPERATURE & HUMIDITY ON THE

A THESIS SUBMITTED BY THE HON. MR. JAMES H. HARRIS

A THESIS

SUBMITTED TO THE FACULTY

OF

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BY

JOHN HENRY DODD

IN PARTIAL FULFILLMENT OF THE

REQUIREMENTS FOR THE DEGREE

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## ACKNOWLEDGEMENTS

I want to express my sincere appreciation to Professor S. Tilles for his guidance and assistance in organizing this thesis, and to Dr. V. L. Anderson for his assistance in the statistical analysis. I also want to thank the nine students who gave up six hours of their time to provide the data for this thesis, and my wife for helping make it a finished product.



CONFIDENTIAL

I want to express my sincere appreciation to Professor  
E. Miller for his guidance and assistance in organizing  
this team, and to Dr. J. A. Jackson for his assistance  
in the statistical analysis. I also want to thank the nine  
students who gave up their hours of study time to provide  
the data for this team, and my wife for helping with it  
a number of times.

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## ABSTRACT

Although there have been numerous experiments involving the use of metabolic equipment for measuring energy expenditure during the performance of a simple task, none of these have been conducted over a prolonged continuous period. This thesis involved taking three simple tasks and finding the effect on energy expenditure of performing these tasks for sixty-four minutes without interruption. The tasks used were:

1. A seventeen inch transfer of small steel balls at a tempo of 96 one way beats per minute of a metronome.
2. A twenty-five inch motion for each arm between two points at a tempo of 160 one way beats per minute of a metronome.
3. Pedaling a bicycle, with chain disconnected, at a tempo of 138 one way beats per minute of a metronome.

The results of this thesis indicate that the energy expenditure appears to rise rapidly at the beginning of the simple task and does not change significantly for at least a period of time of sixty-four minutes.



ABSTRACT

Although there have been numerous experiments involving the use of metabolic equipment for measuring energy expenditure during the performance of a single task, none of them have been conducted over a prolonged continuous period. This thesis involved taking three simple tasks and finding the effect on energy expenditure of performing these tasks for sixty-four minutes without interruption. The tasks used were:

1. A reversed inch test of small steel balls at a tempo of 60 one way beats per minute of a metronome.

2. A twenty-five inch motion for each arm between two points at a tempo of 120 one way beats per minute of a metronome.

3. Pedaling a bicycle, with chain disconnected, at a tempo of 120 one way beats per minute of a metronome.

The results of this thesis indicate that the energy expenditure appears to rise rapidly at the beginning of the single task and does not change significantly for at least a period of time of sixty-four minutes.

# DETERMINATION OF THE EFFECT OF PERFORMING A SIMPLE TASK OVER A PROLONGED PERIOD ON THE RATE OF ENERGY EXPENDITURE

## INTRODUCTION AND PURPOSE

This is another in the series of theses conducted in the Metabolic Laboratory of Purdue University and employing the use of the Sanborn EIS Metabolism Tester. During the years since 1907 there have been many experiments conducted involving the measurement of energy expenditure by use of metabolic studies of various tasks, but none of these studies have been conducted for a prolonged continuous period. This thesis is undertaken to determine just what effect a prolonged period of performance of a simple task will have on energy expenditure. A bi-product of the research will be a statement of the length of time, up to the time limit used, that each of the simple tasks employed can be accomplished before a significant change in energy expenditure is noted.

DETERMINATION OF THE EFFECT OF IRRADIATION & TEMPERATURE ON THE  
A PROPOSED PAPER ON THE STATE OF ENERGY EXPENDITURE

## INTRODUCTION AND SUMMARY

This is another in the series of papers presented in  
the Metabolic Laboratory of Johns Hopkins University and employing  
the use of the Sarnoff and Metabolism Test. During the  
years since 1907 there have been many experiments conducted  
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energy expenditure. A bi-product of the research will be a  
statement of the length of time, up to the time limit used,  
that each of the simple tasks employed can be accomplished  
before a significant change in energy expenditure is noted.



## PROCEDURE

Due to the length of time required to test each student and the number of theses being conducted on the metabolic equipment at the time of this study, it was decided to limit the testing to nine male students. These students were selected at random from motion and time study classes at Purdue University. No attempt was made to select students of the same age, height or weight, as can be seen in Table 1.

The limitations explained in the previous paragraph are also the reasons that the time of testing was not limited to the early morning period. To eliminate the possibility of the order of tests having an effect on the results, the tests were conducted in accordance with Table 2. Only one test per student was conducted on any particular day.

Prior to each test the student to be tested was allowed to become familiar with the procedure in performing the task. On the day a particular test was to be performed the student came to the laboratory and spent the first thirty minutes resting in a reclined position. Just prior to the end of the thirty minute rest period the student got into position for the test to be performed; the nose clamp was adjusted and the mouthpiece shield inserted. With the beginning of the test as "zero" time, the following schedule was adhered to for all the tests:

One to two lengths of time required to test each student and the number of cases being conducted on the available equipment at the time of this study, it was decided to limit the testing to nine male students. These students were selected at random from sections and were given a written test at Princeton University. No attempt was made to select students of the same age, height or weight, as can be seen in Table I. The limitations explained in the previous paragraph are also the reasons that the time of testing was not limited to the early morning period. To eliminate the possibility of the order of cases having an effect on the results, the tests were conducted in accordance with Table II. Only one test per student was conducted on any particular day.

It is to be noted that the attempt to be precise was almost as basic familiar with the procedure in performing the test. On the day a particular test was to be performed the student came to the laboratory and spent the first thirty minutes resting in a reclined position. Just prior to the end of the thirty minute rest period the student was taken position for the test to be performed; the room light was adjusted and the microphone cable inserted. With the beginning of the test an "easy" time, one following schedule was allowed to for all the tests:

TABLE 1

<u>STUDENT</u>	<u>AGE</u>	<u>HEIGHT</u>	<u>WEIGHT</u>
1	32	5'-9"	161
2	29	5'-11"	133
3	29	5'-6"	162
4	25	6'-0"	190
5	24	5'-11"	176
6	21	5'-7"	154
7	24	6'-2"	200
8	29	5'-9"	142
9	21	6'-0"	155



# TABLE I

GROUP	THICKNESS	AREA	THICKNESS
10A	0.1-0.2	25	1
10B	0.1-0.2	25	2
10C	0.1-0.2	25	3
10D	0.1-0.2	25	4
10E	0.1-0.2	25	5
10F	0.1-0.2	25	6
10G	0.1-0.2	25	7
10H	0.1-0.2	25	8
10I	0.1-0.2	25	9

Time	Elapsed Time	Notes
00-01	1 minute	Operator checked main air valve performing test.
00-02	2 minutes	Various readings of the system. The electrical equipment was turned on and a pump was run.
00-03	3 minutes	Same as 00-02, slightly.
00-04	4 minutes	Same as 00-03, slightly.

TABLE 2

SEQUENCE OF TESTS

<u>STUDENT</u>		<u>1st TEST</u>	<u>2nd TEST</u>	<u>3rd TEST</u>
1	1 minute	1	2	3
2	1 minute	3	1	2
3	1 minute	1	3	2
4	1 minute	3	2	1
5	1 minute	2	1	3
6	1 minute	2	3	1
7	1 minute	1	2	3
8	1 minute	3	2	1
9	1 minute	2	1	3

Test 1 consisted of a series of tests. The first test was a test of the main air valve. The second test was a test of the electrical equipment. The third test was a test of the pump. The fourth test was a test of the various readings of the system. The fifth test was a test of the main air valve. The sixth test was a test of the electrical equipment. The seventh test was a test of the pump. The eighth test was a test of the various readings of the system. The ninth test was a test of the main air valve. The tenth test was a test of the electrical equipment. The eleventh test was a test of the pump. The twelfth test was a test of the various readings of the system. The thirteenth test was a test of the main air valve. The fourteenth test was a test of the electrical equipment. The fifteenth test was a test of the pump. The sixteenth test was a test of the various readings of the system. The seventeenth test was a test of the main air valve. The eighteenth test was a test of the electrical equipment. The nineteenth test was a test of the pump. The twentieth test was a test of the various readings of the system. The twenty-first test was a test of the main air valve. The twenty-second test was a test of the electrical equipment. The twenty-third test was a test of the pump. The twenty-fourth test was a test of the various readings of the system. The twenty-fifth test was a test of the main air valve. The twenty-sixth test was a test of the electrical equipment. The twenty-seventh test was a test of the pump. The twenty-eighth test was a test of the various readings of the system. The twenty-ninth test was a test of the main air valve. The thirtieth test was a test of the electrical equipment. The thirty-first test was a test of the pump. The thirty-second test was a test of the various readings of the system. The thirty-third test was a test of the main air valve. The thirty-fourth test was a test of the electrical equipment. The thirty-fifth test was a test of the pump. The thirty-sixth test was a test of the various readings of the system. The thirty-seventh test was a test of the main air valve. The thirty-eighth test was a test of the electrical equipment. The thirty-ninth test was a test of the pump. The fortieth test was a test of the various readings of the system. The forty-first test was a test of the main air valve. The forty-second test was a test of the electrical equipment. The forty-third test was a test of the pump. The forty-fourth test was a test of the various readings of the system. The forty-fifth test was a test of the main air valve. The forty-sixth test was a test of the electrical equipment. The forty-seventh test was a test of the pump. The forty-eighth test was a test of the various readings of the system. The forty-ninth test was a test of the main air valve. The fiftieth test was a test of the electrical equipment. The fifty-first test was a test of the pump. The fifty-second test was a test of the various readings of the system. The fifty-third test was a test of the main air valve. The fifty-fourth test was a test of the electrical equipment. The fifty-fifth test was a test of the pump. The fifty-sixth test was a test of the various readings of the system. The fifty-seventh test was a test of the main air valve. The fifty-eighth test was a test of the electrical equipment. The fifty-ninth test was a test of the pump. The sixtieth test was a test of the various readings of the system. The sixty-first test was a test of the main air valve. The sixty-second test was a test of the electrical equipment. The sixty-third test was a test of the pump. The sixty-fourth test was a test of the various readings of the system. The sixty-fifth test was a test of the main air valve. The sixty-sixth test was a test of the electrical equipment. The sixty-seventh test was a test of the pump. The sixty-eighth test was a test of the various readings of the system. The sixty-ninth test was a test of the main air valve. The seventieth test was a test of the electrical equipment. The seventy-first test was a test of the pump. The seventy-second test was a test of the various readings of the system. The seventy-third test was a test of the main air valve. The seventy-fourth test was a test of the electrical equipment. The seventy-fifth test was a test of the pump. The seventy-sixth test was a test of the various readings of the system. The seventy-seventh test was a test of the main air valve. The seventy-eighth test was a test of the electrical equipment. The seventy-ninth test was a test of the pump. The eightieth test was a test of the various readings of the system. The eighty-first test was a test of the main air valve. The eighty-second test was a test of the electrical equipment. The eighty-third test was a test of the pump. The eighty-fourth test was a test of the various readings of the system. The eighty-fifth test was a test of the main air valve. The eighty-sixth test was a test of the electrical equipment. The eighty-seventh test was a test of the pump. The eighty-eighth test was a test of the various readings of the system. The eighty-ninth test was a test of the main air valve. The ninetieth test was a test of the electrical equipment. The ninety-first test was a test of the pump. The ninety-second test was a test of the various readings of the system. The ninety-third test was a test of the main air valve. The ninety-fourth test was a test of the electrical equipment. The ninety-fifth test was a test of the pump. The ninety-sixth test was a test of the various readings of the system. The ninety-seventh test was a test of the main air valve. The ninety-eighth test was a test of the electrical equipment. The ninety-ninth test was a test of the pump. The hundredth test was a test of the various readings of the system.

<sup>1</sup>Source: W. H. Rouse and W. H. Rouse, "The Sequence of Tests in a System of Tests," *Proceedings of the American Society of Mechanical Engineers*, New York, 1910, p. 200.  
<sup>2</sup>W. H. Rouse and W. H. Rouse, "The Sequence of Tests in a System of Tests," *Proceedings of the American Society of Mechanical Engineers*, New York, 1910, p. 200.

# TABLE 2

## REVENUE OF TEXAS

1911	1912	1913	1914
1	1	1	1
2	1	2	1
3	2	1	2
4	3	2	3
5	4	3	4
6	5	4	5
7	6	5	6
8	7	6	7
9	8	7	8
10	9	8	9

Time	Elapsed Time	Action
00-01	1 minute	Operator breathed room air while performing task.
01-05	4 minutes	Without knowledge of the operator, the metabolic equipment was turned on and a record run was made.
05-10	5 minutes	Same as 00-01 minutes.
10-14	4 minutes	Same as 01-05 minutes.
14-20	6 minutes	Same as 00-01 minutes.
20-24	4 minutes	Same as 01-05 minutes.
24-30	6 minutes	Same as 00-01 minutes.
30-34	4 minutes	Same as 01-05 minutes.
34-40	6 minutes	Same as 00-01 minutes.
40-44	4 minutes	Same as 01-05 minutes.
44-50	6 minutes	Same as 00-01 minutes.
50-54	4 minutes	Same as 01-05 minutes.
54-60	6 minutes	Same as 00-01 minutes.
60-64	4 minutes	Same as 01-05 minutes.

Test 1 consisted of a seventeen inch transfer, by the right hand, of small steel balls at a tempo of 96 one way beats per minute of a metronome. This task was rated at 110 percent of standard pace by comparison with a multi-image step film.<sup>1</sup> It is the exact task used by J. A. Marks

---

<sup>1</sup>Mundel, M. E., Motion and Time Study Principles and Practice, Prentice-Hall Inc., New York, 1950, p. 324.

---

and W. D. Surface in their work.<sup>2</sup> See Figure 1.





WILSON, J. A., The Effect of Position and Temperature on Circulation of the Blood, *Journal of Biological Chemistry*, Vol. 10, No. 1, 1914.

WILSON, J. A., The Effect of Position on the Metabolic Rate of the Blood, *Journal of Biological Chemistry*, Vol. 10, No. 1, 1914.

Test 1 consisted of a **FIGURE 1** live limb within the reach

and between points of  
and hands per minute  
100 percent of blood  
of the limb used in

WILSON, J. A., in *Journal of Biological Chemistry*, Vol. 10, No. 1, 1914.

Test 2 consisted of  
the limb used in  
hands per minute of  
100 percent of blood

age of 100 mm  
limb was placed at  
distance of 100  
See Figure 1.

copy of the  
Wiley Inter-  
Science.

with the limb  
at 100 mm and  
the point of



**POSITIONS FOR TEST 1**



1. 100000



1. 100000

<sup>2</sup>Marks, J. A., The Effect of Praise and Reprimand on Workers' Energy Expenditure, Master of Science Thesis, Purdue University, Lafayette, Indiana, 1951.

Surface, W. D., The Effect of Music on the Metabolic Rate of Workers, Master of Science Thesis, Purdue University, Lafayette, Indiana, 1951.

Test 2 consisted of a twenty-five inch motion for each arm between points on the table edge at a tempo of 160 one way beats per minute of a metronome. This task was rated at 135 percent of standard pace. This task is similiar to one of the tasks used by S. Tilles in his work.<sup>3</sup> See Figure 2.

<sup>3</sup>Tilles, S., An Investigation of the Suitability of the Sanborn EIS Metabolism Tester to Basic Time Study Experimentation, Master of Science Thesis, Purdue University, Lafayette, Indiana, 1949.

Test 3 consisted of pedaling a bicycle, with the chain to the back wheel disconnected, at a tempo of 138 one way beats per minute of a metronome. This task was rated at 120 percent of standard pace. See Figure 3.

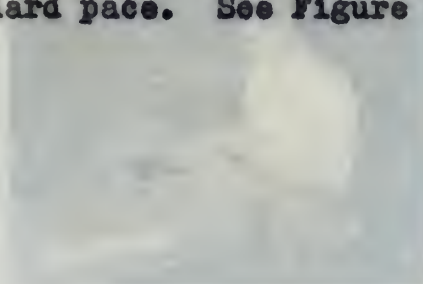


FIGURE 3

James, J. A., The Effect of Stress and Repression on Memory,  
Psychological Monographs, Number 10, University of Chicago Press,  
Chicago, 1931.

Wirtz, W. D., The Effect of Stress on the Memory of  
of Memory, Number 10, University of Chicago Press,  
Chicago, 1931.

Test 1 consisted of a twenty-five inch wheel with two  
and between points on the wheel edge at a tempo of 100 rpm  
was made per minute of a test. This test was made at  
100 percent of standard pace. This test is similar to one  
of the tests used by S. Wirtz in his work. See Figure 2.

Wirtz, W. D., An Investigation of the Effect of the  
of Memory, Number 10, University of Chicago Press,  
Chicago, 1931.

Test 2 consisted of pedaling a bicycle, with the wheel  
to the back wheel disconnected, at a tempo of 100 rpm  
was made per minute of a test. This test was made at  
100 percent of standard pace. See Figure 2.

**FIGURE 2**



**POSITIONS FOR TEST 2**



A HOUSE



A TIME OUT CHAIR

## POSITIONS AND DIMENSIONS

The subject of these studies was asked to maintain the  
position of the elbow extended from the horizontal line,  
Figure 3 to 11 describe the position for the various studies.

**FIGURE 3**

Figure 12 to 17 present the dimensions for all positions for

and back, and also  
position of the hand  
and of the wrist of  
the subject. The hand  
was held in a  
neutral position, forearm  
extended, hand at 90  
degrees, and the  
wrist neutral. The  
hand was held in a  
neutral position,  
forearm extended,  
hand at 90 degrees,  
and the wrist neutral.

The position  
of the hand was



\* obtained by the  
S. Appendix A  
a photograph,  
back of the hand  
of the right hand  
and the left  
hand. In the  
S. Appendix A  
a photograph of  
the right hand  
and the left  
hand. The  
position of the  
hand was held in  
a neutral position.

The position  
of the hand was

## POSITIONS FOR TEST 3

The test was conducted with the subject standing and the  
arm extended forward, hand at 90 degrees, and the wrist  
neutral. The position of the hand was held in a neutral  
position, forearm extended, hand at 90 degrees, and the wrist  
neutral.



PLATE 1



PLATE 1

## RESULTS AND CONCLUSION

The method of least squares was used to calculate the slopes of the charts obtained from the metabolic tester. Tables 3 to 11 contain the results for the various students. Tables 12 to 17 present the information for all students for each test, and also include the values of "t" obtained by the Student "t" technique of statistical analysis. Appendix A shows an example of how these "t" values were calculated. The Student "t" technique indicated that for each of the three tests there was no significant difference, at the five per-cent level, between the base reading for the test and the readings taken at any other time during the test. In the analysis, all the values obtained for student 8 were omitted as that student was a controlled breather and his charts did not have sufficient points to give a consistent value. The information for student 7, test 2, was also eliminated due to the fact that the nose clamp became loose during the base run and caused the obviously false readings.

The conclusion arrived at is that for a relatively simple task similiar to those used in this thesis the energy expenditure rises rapidly during the first minute of performing the task and does not change significantly for at least sixty-four minutes. Since all the previous experiments in the Purdue Metabolic Laboratory have been based on the fact

## RESULTS AND CONCLUSIONS

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The conclusion arrived at is that for a relatively simple test similar to those used in this thesis the energy expenditure rises rapidly during the first minute of exerting the task and does not change significantly for at least sixty-four minutes. Since all the previous experiments in the Marine Metabolic Laboratory have been based on the fact







that the energy expenditure did remain constant, this thesis  
helps to verify that fact. It also points out that rest  
periods need not be used once the work has commenced if all  
readings can be obtained in a one hour period.

TABLE 3

## STUDENT NUMBER 1

<u>TEST</u>	<u>TIME(MIN)</u>	<u>TEMP.</u>	<u>SLOPE</u>	<u>% OF 01-05 MIN.</u>
1	01-05	20 C	.430	100
	10-14	23 C	.434	101
	20-24	24 C	.450	105
	30-34	24 C	.459	107
	40-44	25 C	.549	128
	50-54	26 C	.474	110
	60-64	26 C	.460	107
2	01-05	26 C	.602	100
	10-14	27 C	.612	102
	20-24	27 C	.600	100
	30-34	28 C	.622	103
	40-44	28 C	.596	99
	50-54	27 C	.637	106
	60-64	28 C	.621	103
3	01-05	23 C	.734	100
	10-14	24 C	.736	100
	20-24	24 C	.660	90
	30-34	25 C	.628	86
	40-44	25 C	.622	85
	50-54	26 C	.668	91
	60-64	27 C	.674	92

	TEST 1	TEST 2	TEST 3
DATE	3/13/51	4/4/51	4/12/51
START TIME	2:38 P.M.	3:53 P.M.	4:35 P.M.
BAROMETER	28.90"	29.25"	28.70"

TABLE 2

STUDENT NUMBER 1				STUDENT NUMBER 2			
TEST	TIME (MIN)	TIME	SCORE	TEST	TIME	SCORE	TIME
1	01-03	20 0	.430	1	01-03	.430	01-03
	10-14	22 0	.434		10-14	.434	10-14
	20-24	24 0	.430		20-24	.430	20-24
	30-34	24 0	.430		30-34	.430	30-34
	40-44	23 0	.430		40-44	.430	40-44
	50-54	23 0	.430		50-54	.430	50-54
	60-64	23 0	.430		60-64	.430	60-64
2	01-03	23 0	.408	2	01-03	.408	01-03
	10-14	27 0	.418		10-14	.418	10-14
	20-24	27 0	.400		20-24	.400	20-24
	30-34	28 0	.405		30-34	.405	30-34
	40-44	28 0	.438		40-44	.438	40-44
	50-54	27 0	.427		50-54	.427	50-54
	60-64	28 0	.421		60-64	.421	60-64
3	01-03	20 0	.434	3	01-03	.434	01-03
	10-14	24 0	.438		10-14	.438	10-14
	20-24	24 0	.400		20-24	.400	20-24
	30-34	23 0	.438		30-34	.438	30-34
	40-44	22 0	.438		40-44	.438	40-44
	50-54	23 0	.400		50-54	.400	50-54
	60-64	27 0	.434		60-64	.434	60-64
TEST 1	2/12/21	2:00 P.M.	28.00%	TEST 2	4/4/21	3:00 P.M.	24.25%
DATE	2/12/21			DATE	4/4/21		
START TIME	2:00 P.M.			START TIME	3:00 P.M.		
END TIME	28.00%			END TIME	24.25%		

TABLE 4

STUDENT NUMBER 2

<u>TEST</u>	<u>TIME(MIN)</u>	<u>TEMP.</u>	<u>SLOPE</u>	<u>% OF 01-05 MIN.</u>
1	01-05	27 C	.458	100
	10-14	28 C	.475	104
	20-24	29 C	.451	98
	30-34	29 C	.492	107
	40-44	30 C	.432	94
	50-54	31 C	.442	97
	60-64	31 C	.450	98
2	01-05	26 C	.634	100
	10-14	27 C	.619	98
	20-24	27 C	.589	93
	30-34	27 C	.580	91
	40-44	27 C	.590	93
	50-54	27 C	.625	99
	60-64	27 C	.535	84
3	01-05	26 C	.531	100
	10-14	26 C	.619	117
	20-24	27 C	.609	115
	30-34	27 C	.584	110
	40-44	27 C	.549	103
	50-54	28 C	.562	106
	60-64	28 C	.528	99

TEST 1

TEST 2

TEST 3

DATE 3/23/51  
 START TIME 4:20 P.M.  
 BAROMETER 29.37"

4/4/51  
 9:19 P.M.  
 29.29"

3/19/51  
 4:00 P.M.  
 29.37"



TABLE 2

TEST	TIME (MIN)	TEMP.	GROUP	W OF 01-02 MIN.
1	01-02	27 C	555.	100
	10-14	28 C	572.	112
	20-24	29 C	581.	98
	30-34	29 C	574.	107
	40-44	30 C	582.	94
	50-54	31 C	581.	95
	60-64	31 C	580.	98
2	01-02	28 C	555.	100
	10-14	27 C	575.	94
	20-24	27 C	582.	92
	30-34	27 C	580.	91
	40-44	27 C	580.	98
	50-54	27 C	582.	98
	60-64	27 C	582.	94
3	01-02	28 C	581.	100
	10-14	28 C	579.	117
	20-24	27 C	580.	118
	30-34	27 C	584.	119
	40-44	27 C	584.	102
	50-54	28 C	582.	100
	60-64	28 C	582.	92
TEST 1	5/23/51	4:40 P.M.	22.55	
TEST 2	6/4/51	3:10 P.M.	22.52	
TEST 3	8/16/51	4:00 P.M.	23.24	

DATE  
START TIME  
HAMMETER

TABLE 5

STUDENT NUMBER 3

<u>TEST</u>	<u>TIME(MIN)</u>	<u>TEMP.</u>	<u>SLOPE</u>	<u>% OF 01-05 MIN.</u>
1	01-05	26 C	.423	100
	10-14	27 C	.438	104
	20-24	28 C	.409	97
	30-34	28 C	.392	93
	40-44	28 C	.421	100
	50-54	28 C	.414	98
	60-64	29 C	.425	100
2	01-05	22 C	.575	100
	10-14	23 C	.519	90
	20-24	25 C	.492	86
	30-34	25 C	.528	92
	40-44	26 C	.496	86
	50-54	26 C	.551	96
	60-64	26 C	.475	83
3	01-05	25 C	.718	100
	10-14	25 C	.703	98
	20-24	27 C	.669	93
	30-34	26 C	.689	96
	40-44	28 C	.689	96
	50-54	29 C	.767	107
	60-64	29 C	.839	117

	TEST 1	TEST 2	TEST 3
DATE	4/5/51	4/27/51	4/23/51
START TIME	2:45 P.M.	12:33 P.M.	12:00 P.M.
BAROMETER	29.33"	29.47"	29.62"

5. *WILSON, T. G.* 1964.

TEST	DATE/TIME	TIME	TIME	TIME
1	00-10	0 00	0 00	00-10
2	01-01	0 01	0 01	01-01
3	02-02	0 02	0 02	02-02
4	03-03	0 03	0 03	03-03
5	04-04	0 04	0 04	04-04
6	05-05	0 05	0 05	05-05
7	06-06	0 06	0 06	06-06
8	07-07	0 07	0 07	07-07
9	08-08	0 08	0 08	08-08
10	09-09	0 09	0 09	09-09
11	10-10	0 10	0 10	10-10
12	11-11	0 11	0 11	11-11
13	12-12	0 12	0 12	12-12
14	13-13	0 13	0 13	13-13
15	14-14	0 14	0 14	14-14
16	15-15	0 15	0 15	15-15
17	16-16	0 16	0 16	16-16
18	17-17	0 17	0 17	17-17
19	18-18	0 18	0 18	18-18
20	19-19	0 19	0 19	19-19
21	20-20	0 20	0 20	20-20
22	21-21	0 21	0 21	21-21
23	22-22	0 22	0 22	22-22
24	23-23	0 23	0 23	23-23
25	24-24	0 24	0 24	24-24
26	25-25	0 25	0 25	25-25
27	26-26	0 26	0 26	26-26
28	27-27	0 27	0 27	27-27
29	28-28	0 28	0 28	28-28
30	29-29	0 29	0 29	29-29
31	30-30	0 30	0 30	30-30
32	31-31	0 31	0 31	31-31
33	32-32	0 32	0 32	32-32
34	33-33	0 33	0 33	33-33
35	34-34	0 34	0 34	34-34
36	35-35	0 35	0 35	35-35
37	36-36	0 36	0 36	36-36
38	37-37	0 37	0 37	37-37
39	38-38	0 38	0 38	38-38
40	39-39	0 39	0 39	39-39
41	40-40	0 40	0 40	40-40
42	41-41	0 41	0 41	41-41
43	42-42	0 42	0 42	42-42
44	43-43	0 43	0 43	43-43
45	44-44	0 44	0 44	44-44
46	45-45	0 45	0 45	45-45
47	46-46	0 46	0 46	46-46
48	47-47	0 47	0 47	47-47
49	48-48	0 48	0 48	48-48
50	49-49	0 49	0 49	49-49
51	50-50	0 50	0 50	50-50
52	51-51	0 51	0 51	51-51
53	52-52	0 52	0 52	52-52
54	53-53	0 53	0 53	53-53
55	54-54	0 54	0 54	54-54
56	55-55	0 55	0 55	55-55
57	56-56	0 56	0 56	56-56
58	57-57	0 57	0 57	57-57
59	58-58	0 58	0 58	58-58
60	59-59	0 59	0 59	59-59
61	60-60	0 60	0 60	60-60
62	61-61	0 61	0 61	61-61
63	62-62	0 62	0 62	62-62
64	63-63	0 63	0 63	63-63
65	64-64	0 64	0 64	64-64
66	65-65	0 65	0 65	65-65
67	66-66	0 66	0 66	66-66
68	67-67	0 67	0 67	67-67
69	68-68	0 68	0 68	68-68
70	69-69	0 69	0 69	69-69
71	70-70	0 70	0 70	70-70

TABLE 6

STUDENT NUMBER 4

<u>TEST</u>	<u>TIME(MIN)</u>	<u>TEMP.</u>	<u>SLOPE</u>	<u>% OF 01-05 MIN.</u>
1	01-05	29 C	.439	100
	10-14	30 C	.502	114
	20-24	30 C	.449	102
	30-34	30 C	.446	102
	40-44	31 C	.458	104
	50-54	31 C	.402	92
	60-64	32 C	.426	97
2	01-05	30 C	.666	100
	10-14	30 C	.735	110
	20-24	29 C	.638	96
	30-34	29 C	.625	94
	40-44	30 C	.600	90
	50-54	29 C	.629	94
	60-64	31 C	.640	96
3	01-05	22 C	.618	100
	10-14	22 C	.810	131
	20-24	24 C	.708	115
	30-34	25 C	.688	111
	40-44	25 C	.687	111
	50-54	25 C	.747	121
	60-64	24 C	.787	127

	TEST 1	TEST 2	TEST 3
DATE	4/27/51	4/25/51	4/9/51
START TIME	4:00 P.M.	4:07 P.M.	10:45 A.M.
BAROMETER	29.49"	29.24"	28.96"



# TABLE 1

STATION NO. 1000

TIME (H:M)	DATE	TIME (H:M)	DATE	TIME (H:M)	DATE
01-00	100	01-00	100	01-00	100
01-10	100	01-10	100	01-10	100
01-20	100	01-20	100	01-20	100
01-30	100	01-30	100	01-30	100
01-40	100	01-40	100	01-40	100
01-50	100	01-50	100	01-50	100
02-00	100	02-00	100	02-00	100
02-10	100	02-10	100	02-10	100
02-20	100	02-20	100	02-20	100
02-30	100	02-30	100	02-30	100
02-40	100	02-40	100	02-40	100
02-50	100	02-50	100	02-50	100
03-00	100	03-00	100	03-00	100
03-10	100	03-10	100	03-10	100
03-20	100	03-20	100	03-20	100
03-30	100	03-30	100	03-30	100
03-40	100	03-40	100	03-40	100
03-50	100	03-50	100	03-50	100
04-00	100	04-00	100	04-00	100
04-10	100	04-10	100	04-10	100
04-20	100	04-20	100	04-20	100
04-30	100	04-30	100	04-30	100
04-40	100	04-40	100	04-40	100
04-50	100	04-50	100	04-50	100
05-00	100	05-00	100	05-00	100
05-10	100	05-10	100	05-10	100
05-20	100	05-20	100	05-20	100
05-30	100	05-30	100	05-30	100
05-40	100	05-40	100	05-40	100
05-50	100	05-50	100	05-50	100
06-00	100	06-00	100	06-00	100
06-10	100	06-10	100	06-10	100
06-20	100	06-20	100	06-20	100
06-30	100	06-30	100	06-30	100
06-40	100	06-40	100	06-40	100
06-50	100	06-50	100	06-50	100
07-00	100	07-00	100	07-00	100
07-10	100	07-10	100	07-10	100
07-20	100	07-20	100	07-20	100
07-30	100	07-30	100	07-30	100
07-40	100	07-40	100	07-40	100
07-50	100	07-50	100	07-50	100
08-00	100	08-00	100	08-00	100
08-10	100	08-10	100	08-10	100
08-20	100	08-20	100	08-20	100
08-30	100	08-30	100	08-30	100
08-40	100	08-40	100	08-40	100
08-50	100	08-50	100	08-50	100
09-00	100	09-00	100	09-00	100
09-10	100	09-10	100	09-10	100
09-20	100	09-20	100	09-20	100
09-30	100	09-30	100	09-30	100
09-40	100	09-40	100	09-40	100
09-50	100	09-50	100	09-50	100
10-00	100	10-00	100	10-00	100
10-10	100	10-10	100	10-10	100
10-20	100	10-20	100	10-20	100
10-30	100	10-30	100	10-30	100
10-40	100	10-40	100	10-40	100
10-50	100	10-50	100	10-50	100
11-00	100	11-00	100	11-00	100
11-10	100	11-10	100	11-10	100
11-20	100	11-20	100	11-20	100
11-30	100	11-30	100	11-30	100
11-40	100	11-40	100	11-40	100
11-50	100	11-50	100	11-50	100
12-00	100	12-00	100	12-00	100
12-10	100	12-10	100	12-10	100
12-20	100	12-20	100	12-20	100
12-30	100	12-30	100	12-30	100
12-40	100	12-40	100	12-40	100
12-50	100	12-50	100	12-50	100

TABLE 7

STUDENT NUMBER 5

<u>TEST</u>	<u>TIME(MIN)</u>	<u>TEMP.</u>	<u>SLOPE</u>	<u>% OF 01-05 MIN.</u>
1	01-05	24 C	.482	100
	10-14	25 C	.521	108
	20-24	25 C	.484	100
	30-34	26 C	.489	101
	40-44	27 C	.539	112
	50-54	27 C	.471	98
	60-64	27 C	.443	92
2	01-05	22 C	.709	100
	10-14	25 C	.682	96
	20-24	25 C	.639	90
	30-34	26 C	.633	89
	40-44	26 C	.584	82
	50-54	27 C	.602	85
	60-64	27 C	.677	95
3	01-05	22 C	.651	100
	10-14	24 C	.756	116
	20-24	24 C	.690	106
	30-34	23 C	.689	106
	40-44	24 C	.656	101
	50-54	24 C	.599	92
	60-64	24 C	.625	96

TEST 1

TEST 2

TEST 3

DATE  
START TIME  
BAROMETER

4/12/51  
12:50 P.M.  
28.70"

4/9/51  
1:00 P.M.  
28.94"

4/19/51  
12:48 P.M.  
29.36"

# TABLE 4

STATION NUMBER 2

TIME (MIN)	TEMP	WIND	WIND DIR	WIND SPC
01-01	24.0	0.0	0.0	0.0
01-04	23.0	0.0	0.0	0.0
01-08	22.0	0.0	0.0	0.0
01-12	21.0	0.0	0.0	0.0
01-16	20.0	0.0	0.0	0.0
01-20	19.0	0.0	0.0	0.0
01-24	18.0	0.0	0.0	0.0
01-28	17.0	0.0	0.0	0.0
01-32	16.0	0.0	0.0	0.0
01-36	15.0	0.0	0.0	0.0
01-40	14.0	0.0	0.0	0.0
01-44	13.0	0.0	0.0	0.0
01-48	12.0	0.0	0.0	0.0
01-52	11.0	0.0	0.0	0.0
01-56	10.0	0.0	0.0	0.0
02-00	9.0	0.0	0.0	0.0
02-04	8.0	0.0	0.0	0.0
02-08	7.0	0.0	0.0	0.0
02-12	6.0	0.0	0.0	0.0
02-16	5.0	0.0	0.0	0.0
02-20	4.0	0.0	0.0	0.0
02-24	3.0	0.0	0.0	0.0
02-28	2.0	0.0	0.0	0.0
02-32	1.0	0.0	0.0	0.0
02-36	0.0	0.0	0.0	0.0
02-40	-1.0	0.0	0.0	0.0
02-44	-2.0	0.0	0.0	0.0
02-48	-3.0	0.0	0.0	0.0
02-52	-4.0	0.0	0.0	0.0
02-56	-5.0	0.0	0.0	0.0
03-00	-6.0	0.0	0.0	0.0
03-04	-7.0	0.0	0.0	0.0
03-08	-8.0	0.0	0.0	0.0
03-12	-9.0	0.0	0.0	0.0
03-16	-10.0	0.0	0.0	0.0
03-20	-11.0	0.0	0.0	0.0
03-24	-12.0	0.0	0.0	0.0
03-28	-13.0	0.0	0.0	0.0
03-32	-14.0	0.0	0.0	0.0
03-36	-15.0	0.0	0.0	0.0
03-40	-16.0	0.0	0.0	0.0
03-44	-17.0	0.0	0.0	0.0
03-48	-18.0	0.0	0.0	0.0
03-52	-19.0	0.0	0.0	0.0
03-56	-20.0	0.0	0.0	0.0
04-00	-21.0	0.0	0.0	0.0

DATE	TIME	WIND	WIND DIR	WIND SPC
11/18/51	11:00 A.M.	20.0	0.0	0.0
11/19/51	11:00 A.M.	20.0	0.0	0.0
11/20/51	11:00 A.M.	20.0	0.0	0.0
11/21/51	11:00 A.M.	20.0	0.0	0.0
11/22/51	11:00 A.M.	20.0	0.0	0.0
11/23/51	11:00 A.M.	20.0	0.0	0.0
11/24/51	11:00 A.M.	20.0	0.0	0.0
11/25/51	11:00 A.M.	20.0	0.0	0.0
11/26/51	11:00 A.M.	20.0	0.0	0.0
11/27/51	11:00 A.M.	20.0	0.0	0.0
11/28/51	11:00 A.M.	20.0	0.0	0.0
11/29/51	11:00 A.M.	20.0	0.0	0.0
11/30/51	11:00 A.M.	20.0	0.0	0.0

TABLE 8

STUDENT NUMBER 6

<u>TEST</u>	<u>TIME(MIN)</u>	<u>TEMP.</u>	<u>SLOPE</u>	<u>% OF 01-05 MIN.</u>
1	01-05	25 C	.470	100
	10-14	25 C	.435	93
	20-24	26 C	.458	97
	30-34	26 C	.449	96
	40-44	27 C	.450	96
	50-54	27 C	.424	90
	60-64	28 C	.429	91
2	01-05	27 C	.727	100
	10-14	27 C	.766	105
	20-24	28 C	.700	96
	30-34	27 C	.703	97
	40-44	27 C	.600	82
	50-54	28 C	.636	88
	60-64	28 C	.617	85
3	01-05	26 C	.823	100
	10-14	27 C	.833	101
	20-24	28 C	.849	103
	30-34	28 C	.841	102
	40-44	29 C	.916	111
	50-54	29 C	.925	112
	60-64	29 C	1.006	122

	TEST 1	TEST 2	TEST 3
DATE	4/20/51	4/13/51	4/14/51
START TIME	9:48 A.M.	4:00 P.M.	2:40 P.M.
BAROMETER	29.62"	28.74"	28.92"



# TABLE 2

STATIONARY RECORDS

TEST	TIME (MIN)	TEMP.	WIND	WIND DIR
1	00-00	55.0	1.0	000
	01-00	55.0	1.0	000
	02-00	55.0	1.0	000
	03-00	55.0	1.0	000
	04-00	55.0	1.0	000
	05-00	55.0	1.0	000
	06-00	55.0	1.0	000
	07-00	55.0	1.0	000
2	08-00	55.0	1.0	000
	09-00	55.0	1.0	000
	10-00	55.0	1.0	000
	11-00	55.0	1.0	000
	12-00	55.0	1.0	000
	13-00	55.0	1.0	000
	14-00	55.0	1.0	000
	15-00	55.0	1.0	000
3	16-00	55.0	1.0	000
	17-00	55.0	1.0	000
	18-00	55.0	1.0	000
	19-00	55.0	1.0	000
	20-00	55.0	1.0	000
	21-00	55.0	1.0	000
	22-00	55.0	1.0	000
	23-00	55.0	1.0	000
4	24-00	55.0	1.0	000
	25-00	55.0	1.0	000
	26-00	55.0	1.0	000
	27-00	55.0	1.0	000
	28-00	55.0	1.0	000
	29-00	55.0	1.0	000
	30-00	55.0	1.0	000

DATE: 10/10/51  
 TIME: 10:00 A.M.  
 STATION: 1000  
 WIND: 1.0  
 WIND DIR: 000  
 TEMP: 55.0

TABLE 9

## STUDENT NUMBER 7

<u>TEST</u>	<u>TIME(MIN)</u>	<u>TEMP.</u>	<u>SLOPE</u>	<u>% OF 01-05 MIN.</u>
1	01-05	25 C	.541	100
	10-14	25 C	.498	92
	20-24	26 C	.481	89
	30-34	26 C	.479	88
	40-44	27 C	.485	90
	50-54	27 C	.495	92
	60-64	27 C	.453	84
2	01-05	25 C	.498	100
	10-14	26 C	.711	143
	20-24	27 C	.701	142
	30-34	28 C	.662	133
	40-44	28 C	.784	157
	50-54	28 C	.625	126
	60-64	28 C	.648	130
3	01-05	27 C	.905	100
	10-14	28 C	.642	71
	20-24	28 C	.840	93
	30-34	28 C	.814	90
	40-44	29 C	.789	87
	50-54	29 C	.821	91
	60-64	29 C	.788	87

	TEST 1	TEST 2	TEST 3
DATE	4/16/51	4/18/51	4/20/51
START TIME	2:40 P.M.	2:35 P.M.	2:40 P.M.
BAROMETER	29.29"	28.98"	29.54"

TABLE 3

STATION NUMBER 7				
TIME	TIME (MIN)	TEMP.	WIND	WIND DIR
1	01-00	55	0	100
	10-10	52	0	100
	20-20	50	0	100
	30-30	48	0	100
	40-40	45	0	100
	50-50	43	0	100
	60-60	40	0	100
2	01-00	55	0	100
	10-10	52	0	100
	20-20	50	0	100
	30-30	48	0	100
	40-40	45	0	100
	50-50	43	0	100
	60-60	40	0	100
3	01-00	55	0	100
	10-10	52	0	100
	20-20	50	0	100
	30-30	48	0	100
	40-40	45	0	100
	50-50	43	0	100
	60-60	40	0	100

DATE	TIME	STATION	WIND	WIND DIR
8/19/51	8:40 P.M.	27.50"	0	100
8/19/51	8:40 P.M.	27.50"	0	100
8/19/51	8:40 P.M.	27.50"	0	100

TABLE 10

STUDENT NUMBER 8

<u>TEST</u>	<u>TIME(MIN)</u>	<u>TEMP.</u>	<u>SLOPE</u>	<u>% OF 01-05 MIN.</u>
1	01-05	24 C	.454	100
	10-14	25 C	.389	86
	20-24	25 C	.486	107
	30-34	26 C	.380	84
	40-44	26 C	.372	82
	50-54	27 C	.366	81
	60-64	27 C	.398	88
2	01-05	27 C	.490	100
	10-14	28 C	.422	86
	20-24	28 C	.559	114
	30-34	28 C	.685	140
	40-44	28 C	.508	104
	50-54	28 C	.742	151
	60-64	28 C	.686	140
3	01-05	28 C	.567	100
	10-14	29 C	.595	105
	20-24	28 C	.443	78
	30-34	27 C	.611	108
	40-44	27 C	.501	88
	50-54	27 C	.614	108
	60-64	27 C	.497	88

	TEST 1	TEST 2	TEST 3
DATE	4/19/51	4/18/51	4/16/51
START TIME	4:18 P.M.	4:30 P.M.	4:27 P.M.
BAROMETER	29.38"	29.00"	29.32"



OF 1907

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DATE	START TIME	TEST
4/18/01	4:18 P.M.	TEST 1
4/16/01	4:16 P.M.	TEST 2
4/15/01	4:15 P.M.	TEST 3
4/14/01	4:14 P.M.	TEST 4
4/13/01	4:13 P.M.	TEST 5
4/12/01	4:12 P.M.	TEST 6
4/11/01	4:11 P.M.	TEST 7
4/10/01	4:10 P.M.	TEST 8
4/9/01	4:09 P.M.	TEST 9
4/8/01	4:08 P.M.	TEST 10
4/7/01	4:07 P.M.	TEST 11
4/6/01	4:06 P.M.	TEST 12
4/5/01	4:05 P.M.	TEST 13
4/4/01	4:04 P.M.	TEST 14
4/3/01	4:03 P.M.	TEST 15
4/2/01	4:02 P.M.	TEST 16
4/1/01	4:01 P.M.	TEST 17
3/31/01	4:00 P.M.	TEST 18
3/30/01	3:59 P.M.	TEST 19
3/29/01	3:58 P.M.	TEST 20
3/28/01	3:57 P.M.	TEST 21
3/27/01	3:56 P.M.	TEST 22
3/26/01	3:55 P.M.	TEST 23
3/25/01	3:54 P.M.	TEST 24
3/24/01	3:53 P.M.	TEST 25
3/23/01	3:52 P.M.	TEST 26
3/22/01	3:51 P.M.	TEST 27
3/21/01	3:50 P.M.	TEST 28
3/20/01	3:49 P.M.	TEST 29
3/19/01	3:48 P.M.	TEST 30
3/18/01	3:47 P.M.	TEST 31
3/17/01	3:46 P.M.	TEST 32
3/16/01	3:45 P.M.	TEST 33
3/15/01	3:44 P.M.	TEST 34
3/14/01	3:43 P.M.	TEST 35
3/13/01	3:42 P.M.	TEST 36
3/12/01	3:41 P.M.	TEST 37
3/11/01	3:40 P.M.	TEST 38
3/10/01	3:39 P.M.	TEST 39
3/9/01	3:38 P.M.	TEST 40
3/8/01	3:37 P.M.	TEST 41
3/7/01	3:36 P.M.	TEST 42
3/6/01	3:35 P.M.	TEST 43
3/5/01	3:34 P.M.	TEST 44
3/4/01	3:33 P.M.	TEST 45
3/3/01	3:32 P.M.	TEST 46
3/2/01	3:31 P.M.	TEST 47
3/1/01	3:30 P.M.	TEST 48
2/28/01	3:29 P.M.	TEST 49
2/27/01	3:28 P.M.	TEST 50
2/26/01	3:27 P.M.	TEST 51
2/25/01	3:26 P.M.	TEST 52
2/24/01	3:25 P.M.	TEST 53
2/23/01	3:24 P.M.	TEST 54
2/22/01	3:23 P.M.	TEST 55
2/21/01	3:22 P.M.	TEST 56
2/20/01	3:21 P.M.	TEST 57
2/19/01	3:20 P.M.	TEST 58
2/18/01	3:19 P.M.	TEST 59
2/17/01	3:18 P.M.	TEST 60
2/16/01	3:17 P.M.	TEST 61
2/15/01	3:16 P.M.	TEST 62
2/14/01	3:15 P.M.	TEST 63
2/13/01	3:14 P.M.	TEST 64
2/12/01	3:13 P.M.	TEST 65
2/11/01	3:12 P.M.	TEST 66
2/10/01	3:11 P.M.	TEST 67
2/9/01	3:10 P.M.	TEST 68
2/8/01	3:09 P.M.	TEST 69
2/7/01	3:08 P.M.	TEST 70
2/6/01	3:07 P.M.	TEST 71
2/5/01	3:06 P.M.	TEST 72
2/4/01	3:05 P.M.	TEST 73
2/3/01	3:04 P.M.	TEST 74
2/2/01	3:03 P.M.	TEST 75
2/1/01	3:02 P.M.	TEST 76
1/31/01	3:01 P.M.	TEST 77
1/30/01	3:00 P.M.	TEST 78
1/29/01	2:59 P.M.	TEST 79
1/28/01	2:58 P.M.	TEST 80
1/27/01	2:57 P.M.	TEST 81
1/26/01	2:56 P.M.	TEST 82
1/25/01	2:55 P.M.	TEST 83
1/24/01	2:54 P.M.	TEST 84
1/23/01	2:53 P.M.	TEST 85
1/22/01	2:52 P.M.	TEST 86
1/21/01	2:51 P.M.	TEST 87
1/20/01	2:50 P.M.	TEST 88
1/19/01	2:49 P.M.	TEST 89
1/18/01	2:48 P.M.	TEST 90
1/17/01	2:47 P.M.	TEST 91
1/16/01	2:46 P.M.	TEST 92
1/15/01	2:45 P.M.	TEST 93
1/14/01	2:44 P.M.	TEST 94
1/13/01	2:43 P.M.	TEST 95
1/12/01	2:42 P.M.	TEST 96
1/11/01	2:41 P.M.	TEST 97
1/10/01	2:40 P.M.	TEST 98
1/9/01	2:39 P.M.	TEST 99
1/8/01	2:38 P.M.	TEST 100

TABLE 11

STUDENT NUMBER 9

<u>TEST</u>	<u>TIME(MIN)</u>	<u>TEMP.</u>	<u>SLOPE</u>	<u>% OF 01-05 MIN.</u>
1	01-05	27 C	.510	100
	10-14	27 C	.481	94
	20-24	27 C	.438	86
	30-34	29 C	.500	98
	40-44	29 C	.388	76
	50-54	29 C	.466	91
	60-64	30 C	.456	89
2	01-05	27 C	.555	100
	10-14	27 C	.624	112
	20-24	27 C	.609	110
	30-34	27 C	.623	112
	40-44	28 C	.625	113
	50-54	28 C	.601	108
	60-64	28 C	.644	116
3	01-05	31 C	.704	100
	10-14	32 C	.731	104
	20-24	32 C	.695	99
	30-34	33 C	.739	105
	40-44	33 C	.698	99
	50-54	34 C	.699	99
	60-64	34 C	.664	94

TEST 1

TEST 2

TEST 3

DATE  
START TIME  
BAROMETER

4/24/51  
12:40 P.M.  
29.43"

4/23/51  
2:36 P.M.  
29.60"

5/21/51  
2:30 P.M.  
29.18"

# TABLE II

STATION NUMBER 1

TIME	DATE	TIME	DATE	TIME	DATE	TIME	DATE
1	01-00	01.0	01.0	01-00	01.0	01-00	01.0
	01-01	01.1	01.1	01-01	01.1	01-01	01.1
	01-02	01.2	01.2	01-02	01.2	01-02	01.2
	01-03	01.3	01.3	01-03	01.3	01-03	01.3
	01-04	01.4	01.4	01-04	01.4	01-04	01.4
	01-05	01.5	01.5	01-05	01.5	01-05	01.5
	01-06	01.6	01.6	01-06	01.6	01-06	01.6
	01-07	01.7	01.7	01-07	01.7	01-07	01.7
	01-08	01.8	01.8	01-08	01.8	01-08	01.8
	01-09	01.9	01.9	01-09	01.9	01-09	01.9
	01-10	02.0	02.0	01-10	02.0	01-10	02.0
	01-11	02.1	02.1	01-11	02.1	01-11	02.1
	01-12	02.2	02.2	01-12	02.2	01-12	02.2
	01-13	02.3	02.3	01-13	02.3	01-13	02.3
	01-14	02.4	02.4	01-14	02.4	01-14	02.4
	01-15	02.5	02.5	01-15	02.5	01-15	02.5
	01-16	02.6	02.6	01-16	02.6	01-16	02.6
	01-17	02.7	02.7	01-17	02.7	01-17	02.7
	01-18	02.8	02.8	01-18	02.8	01-18	02.8
	01-19	02.9	02.9	01-19	02.9	01-19	02.9
	01-20	03.0	03.0	01-20	03.0	01-20	03.0
	01-21	03.1	03.1	01-21	03.1	01-21	03.1
	01-22	03.2	03.2	01-22	03.2	01-22	03.2
	01-23	03.3	03.3	01-23	03.3	01-23	03.3
	01-24	03.4	03.4	01-24	03.4	01-24	03.4
	01-25	03.5	03.5	01-25	03.5	01-25	03.5
	01-26	03.6	03.6	01-26	03.6	01-26	03.6
	01-27	03.7	03.7	01-27	03.7	01-27	03.7
	01-28	03.8	03.8	01-28	03.8	01-28	03.8
	01-29	03.9	03.9	01-29	03.9	01-29	03.9
	01-30	04.0	04.0	01-30	04.0	01-30	04.0
	01-31	04.1	04.1	01-31	04.1	01-31	04.1
	01-32	04.2	04.2	01-32	04.2	01-32	04.2
	01-33	04.3	04.3	01-33	04.3	01-33	04.3
	01-34	04.4	04.4	01-34	04.4	01-34	04.4
	01-35	04.5	04.5	01-35	04.5	01-35	04.5
	01-36	04.6	04.6	01-36	04.6	01-36	04.6
	01-37	04.7	04.7	01-37	04.7	01-37	04.7
	01-38	04.8	04.8	01-38	04.8	01-38	04.8
	01-39	04.9	04.9	01-39	04.9	01-39	04.9
	01-40	05.0	05.0	01-40	05.0	01-40	05.0
	01-41	05.1	05.1	01-41	05.1	01-41	05.1
	01-42	05.2	05.2	01-42	05.2	01-42	05.2
	01-43	05.3	05.3	01-43	05.3	01-43	05.3
	01-44	05.4	05.4	01-44	05.4	01-44	05.4
	01-45	05.5	05.5	01-45	05.5	01-45	05.5
	01-46	05.6	05.6	01-46	05.6	01-46	05.6
	01-47	05.7	05.7	01-47	05.7	01-47	05.7
	01-48	05.8	05.8	01-48	05.8	01-48	05.8
	01-49	05.9	05.9	01-49	05.9	01-49	05.9
	01-50	06.0	06.0	01-50	06.0	01-50	06.0
	01-51	06.1	06.1	01-51	06.1	01-51	06.1
	01-52	06.2	06.2	01-52	06.2	01-52	06.2
	01-53	06.3	06.3	01-53	06.3	01-53	06.3
	01-54	06.4	06.4	01-54	06.4	01-54	06.4
	01-55	06.5	06.5	01-55	06.5	01-55	06.5
	01-56	06.6	06.6	01-56	06.6	01-56	06.6
	01-57	06.7	06.7	01-57	06.7	01-57	06.7
	01-58	06.8	06.8	01-58	06.8	01-58	06.8
	01-59	06.9	06.9	01-59	06.9	01-59	06.9
	01-60	07.0	07.0	01-60	07.0	01-60	07.0
	01-61	07.1	07.1	01-61	07.1	01-61	07.1
	01-62	07.2	07.2	01-62	07.2	01-62	07.2
	01-63	07.3	07.3	01-63	07.3	01-63	07.3
	01-64	07.4	07.4	01-64	07.4	01-64	07.4
	01-65	07.5	07.5	01-65	07.5	01-65	07.5
	01-66	07.6	07.6	01-66	07.6	01-66	07.6
	01-67	07.7	07.7	01-67	07.7	01-67	07.7
	01-68	07.8	07.8	01-68	07.8	01-68	07.8
	01-69	07.9	07.9	01-69	07.9	01-69	07.9
	01-70	08.0	08.0	01-70	08.0	01-70	08.0
	01-71	08.1	08.1	01-71	08.1	01-71	08.1
	01-72	08.2	08.2	01-72	08.2	01-72	08.2
	01-73	08.3	08.3	01-73	08.3	01-73	08.3
	01-74	08.4	08.4	01-74	08.4	01-74	08.4
	01-75	08.5	08.5	01-75	08.5	01-75	08.5
	01-76	08.6	08.6	01-76	08.6	01-76	08.6
	01-77	08.7	08.7	01-77	08.7	01-77	08.7
	01-78	08.8	08.8	01-78	08.8	01-78	08.8
	01-79	08.9	08.9	01-79	08.9	01-79	08.9
	01-80	09.0	09.0	01-80	09.0	01-80	09.0
	01-81	09.1	09.1	01-81	09.1	01-81	09.1
	01-82	09.2	09.2	01-82	09.2	01-82	09.2
	01-83	09.3	09.3	01-83	09.3	01-83	09.3
	01-84	09.4	09.4	01-84	09.4	01-84	09.4
	01-85	09.5	09.5	01-85	09.5	01-85	09.5
	01-86	09.6	09.6	01-86	09.6	01-86	09.6
	01-87	09.7	09.7	01-87	09.7	01-87	09.7
	01-88	09.8	09.8	01-88	09.8	01-88	09.8
	01-89	09.9	09.9	01-89	09.9	01-89	09.9
	01-90	10.0	10.0	01-90	10.0	01-90	10.0
	01-91	10.1	10.1	01-91	10.1	01-91	10.1
	01-92	10.2	10.2	01-92	10.2	01-92	10.2
	01-93	10.3	10.3	01-93	10.3	01-93	10.3
	01-94	10.4	10.4	01-94	10.4	01-94	10.4
	01-95	10.5	10.5	01-95	10.5	01-95	10.5
	01-96	10.6	10.6	01-96	10.6	01-96	10.6
	01-97	10.7	10.7	01-97	10.7	01-97	10.7
	01-98	10.8	10.8	01-98	10.8	01-98	10.8
	01-99	10.9	10.9	01-99	10.9	01-99	10.9
	01-100	11.0	11.0	01-100	11.0	01-100	11.0

TABLE 12

## RECAPITULATION OF SLOPES FOR TEST 1

<u>STUDENT</u>	<u>01-05</u>	<u>10-14</u>	<u>20-24</u>	<u>30-34</u>	<u>40-44</u>	<u>50-54</u>	<u>60-64</u>
1	.430	.434	.450	.459	.549	.474	.460
2	.458	.475	.451	.492	.432	.442	.450
3	.423	.438	.409	.392	.421	.414	.425
4	.439	.502	.449	.446	.458	.402	.426
5	.482	.521	.484	.489	.539	.471	.443
6	.470	.435	.458	.449	.450	.424	.429
7	.541	.498	.481	.479	.485	.495	.453
8	.454	.389	.486	.380	.372	.366	.398
9	.510	.481	.438	.500	.388	.466	.456
"t" value		.210	1.000	.316	.160	.913	1.625

For seven degrees of freedom "t" is <sup>2.145</sup>2.365 at 5% level.



# TABLE 12

1. ESTIMATION OF TOTALS FOR TEST 1

00-00	00-05	00-10	00-15	00-20	00-25	00-30	THROUGH
000.	074.	048.	020.	000.	000.	000.	1
000.	048.	020.	000.	000.	000.	000.	2
000.	048.	020.	000.	000.	000.	000.	3
000.	048.	020.	000.	000.	000.	000.	4
000.	048.	020.	000.	000.	000.	000.	5
000.	048.	020.	000.	000.	000.	000.	6
000.	048.	020.	000.	000.	000.	000.	7
000.	048.	020.	000.	000.	000.	000.	8
000.	048.	020.	000.	000.	000.	000.	9
000.	048.	020.	000.	000.	000.	000.	10

For seven degrees of freedom "t" is 2.365 at 95 level.

TABLE 13

## RECAPITULATION OF SLOPES FOR TEST 2

<u>STUDENT</u>	<u>01-05</u>	<u>10-14</u>	<u>20-24</u>	<u>30-34</u>	<u>40-44</u>	<u>50-54</u>	<u>60-64</u>
1	.602	.612	.600	.622	.596	.637	.621
2	.634	.619	.589	.580	.590	.625	.535
3	.575	.519	.492	.528	.496	.551	.475
4	.666	.735	.638	.625	.600	.629	.640
5	.709	.682	.639	.633	.584	.602	.677
6	.727	.766	.700	.703	.600	.636	.617
7	.498	.711	.706	.662	.784	.625	.648
8	.490	.422	.559	.685	.508	.742	.686
9	.555	.624	.609	.623	.625	.601	.644
"t" value		.325	.800	.688	1.862	.963	1.000

For <sup>Twelve</sup>six degrees of freedom "t" is <sup>2.179</sup>2.447 at 5% level.

TABLE 13

POPULATION OF STATES FOR 1900

1900	1900	1900	1900	1900	1900	1900	1900
134.	733.	243.	323.	400.	313.	303.	1
233.	633.	033.	030.	333.	313.	333.	2
273.	133.	333.	333.	333.	313.	373.	3
333.	333.	303.	333.	333.	333.	333.	4
373.	333.	333.	333.	333.	333.	333.	5
413.	333.	300.	333.	333.	333.	333.	6
453.	333.	333.	333.	333.	333.	333.	7
493.	333.	333.	333.	333.	333.	333.	8
533.	333.	333.	333.	333.	333.	333.	9
573.	333.	333.	333.	333.	333.	333.	10

For the purpose of this table, the population of the United States is taken from the 1900 census.

TABLE 14

## RECAPITULATION OF SLOPES FOR TEST 3

<u>STUDENT</u>	<u>01-05</u>	<u>10-14</u>	<u>20-24</u>	<u>30-34</u>	<u>40-44</u>	<u>50-54</u>	<u>60-64</u>
1	.734	.736	.660	.628	.622	.668	.674
2	.531	.619	.609	.584	.549	.562	.528
3	.718	.703	.669	.689	.689	.767	.839
4	.618	.810	.708	.688	.687	.747	.787
5	.651	.756	.690	.689	.656	.599	.625
6	.823	.833	.849	.841	.916	.925	1.006
7	.905	.642	.840	.814	.789	.821	.788
8	.567	.595	.443	.611	.501	.614	.497
9	.704	.731	.695	.739	.698	.699	.664
"t" value		.388	.098	.020	.158	.237	.433

For seven degrees of freedom "t" is <sup>2.145</sup>2.365 at 5% level.



2. 1. 1954

7. Total cost of the contract, including the cost of the contract, the cost of the contract, and the cost of the contract.

[illegible]

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TABLE 15

RECAPITULATION OF PERCENTAGES FOR TEST 1

<u>STUDENT</u>	<u>01-05</u>	<u>10-14</u>	<u>20-24</u>	<u>30-34</u>	<u>40-44</u>	<u>50-54</u>	<u>60-64</u>
1	100	101	105	107	128	110	107
2	100	104	98	107	94	97	98
3	100	104	97	93	100	98	100
4	100	114	102	102	104	92	97
5	100	108	100	101	112	98	92
6	100	93	97	96	96	90	91
7	100	92	89	88	90	92	84
8	100	86	107	84	82	81	88
9	100	94	86	98	76	91	89
"t" value		.455	1.444	.427	.000	1.734	2.061

For seven degrees of freedom "t" is 2.365 at 5% level.

TABLE 12

REGISTRATION OF PERSONNEL FOR TEST 1

STUDENT	01-01	10-10	10-11	10-12	10-13	10-14	10-15
1	100	101	101	101	101	101	101
2	100	101	101	101	101	101	101
3	100	101	101	101	101	101	101
4	100	101	101	101	101	101	101
5	100	101	101	101	101	101	101
6	100	101	101	101	101	101	101
7	100	101	101	101	101	101	101
8	100	101	101	101	101	101	101
9	100	101	101	101	101	101	101
10	100	101	101	101	101	101	101
11	100	101	101	101	101	101	101
12	100	101	101	101	101	101	101
13	100	101	101	101	101	101	101
14	100	101	101	101	101	101	101
15	100	101	101	101	101	101	101
16	100	101	101	101	101	101	101
17	100	101	101	101	101	101	101
18	100	101	101	101	101	101	101
19	100	101	101	101	101	101	101
20	100	101	101	101	101	101	101
21	100	101	101	101	101	101	101
22	100	101	101	101	101	101	101
23	100	101	101	101	101	101	101
24	100	101	101	101	101	101	101
25	100	101	101	101	101	101	101
26	100	101	101	101	101	101	101
27	100	101	101	101	101	101	101
28	100	101	101	101	101	101	101
29	100	101	101	101	101	101	101
30	100	101	101	101	101	101	101
31	100	101	101	101	101	101	101
32	100	101	101	101	101	101	101
33	100	101	101	101	101	101	101
34	100	101	101	101	101	101	101
35	100	101	101	101	101	101	101
36	100	101	101	101	101	101	101
37	100	101	101	101	101	101	101
38	100	101	101	101	101	101	101
39	100	101	101	101	101	101	101
40	100	101	101	101	101	101	101
41	100	101	101	101	101	101	101
42	100	101	101	101	101	101	101
43	100	101	101	101	101	101	101
44	100	101	101	101	101	101	101
45	100	101	101	101	101	101	101
46	100	101	101	101	101	101	101
47	100	101	101	101	101	101	101
48	100	101	101	101	101	101	101
49	100	101	101	101	101	101	101
50	100	101	101	101	101	101	101
51	100	101	101	101	101	101	101
52	100	101	101	101	101	101	101
53	100	101	101	101	101	101	101
54	100	101	101	101	101	101	101
55	100	101	101	101	101	101	101
56	100	101	101	101	101	101	101
57	100	101	101	101	101	101	101
58	100	101	101	101	101	101	101
59	100	101	101	101	101	101	101
60	100	101	101	101	101	101	101
61	100	101	101	101	101	101	101
62	100	101	101	101	101	101	101
63	100	101	101	101	101	101	101
64	100	101	101	101	101	101	101
65	100	101	101	101	101	101	101
66	100	101	101	101	101	101	101
67	100	101	101	101	101	101	101
68	100	101	101	101	101	101	101
69	100	101	101	101	101	101	101
70	100	101	101	101	101	101	101
71	100	101	101	101	101	101	101
72	100	101	101	101	101	101	101
73	100	101	101	101	101	101	101
74	100	101	101	101	101	101	101
75	100	101	101	101	101	101	101
76	100	101	101	101	101	101	101
77	100	101	101	101	101	101	101
78	100	101	101	101	101	101	101
79	100	101	101	101	101	101	101
80	100	101	101	101	101	101	101
81	100	101	101	101	101	101	101
82	100	101	101	101	101	101	101
83	100	101	101	101	101	101	101
84	100	101	101	101	101	101	101
85	100	101	101	101	101	101	101
86	100	101	101	101	101	101	101
87	100	101	101	101	101	101	101
88	100	101	101	101	101	101	101
89	100	101	101	101	101	101	101
90	100	101	101	101	101	101	101
91	100	101	101	101	101	101	101
92	100	101	101	101	101	101	101
93	100	101	101	101	101	101	101
94	100	101	101	101	101	101	101
95	100	101	101	101	101	101	101
96	100	101	101	101	101	101	101
97	100	101	101	101	101	101	101
98	100	101	101	101	101	101	101
99	100	101	101	101	101	101	101
100	100	101	101	101	101	101	101

1000 1.424 1.424 1.424 1.424 1.424 1.424 1.424

For every student of Test 1, the value of the test is 1.424 at 1000.

TABLE 16

## RECAPITULATION OF PERCENTAGES FOR TEST 2

<u>STUDENT</u>	<u>01-05</u>	<u>10-14</u>	<u>20-24</u>	<u>30-34</u>	<u>40-44</u>	<u>50-54</u>	<u>60-64</u>
1	100	102	100	103	99	106	103
2	100	98	93	91	93	99	84
3	100	90	86	92	86	96	83
4	100	110	96	94	90	94	96
5	100	96	90	89	82	85	95
6	100	105	96	97	82	88	85
7	100	143	142	133	157	126	130
8	100	86	114	140	104	151	140
9	100	112	110	112	113	108	116
"t" value		.626	2.185	1.025	1.947	1.050	1.193

For six degrees of freedom "t" is 2.447 at 5% level.



# TABLE 10

PERCENTAGE OF FERTILIZATION FOR EACH

PERCENTAGE	10-15	16-20	21-25	26-30	31-35	36-40	41-45
1	100	100	100	100	100	100	100
2	100	100	100	100	100	100	100
3	100	100	100	100	100	100	100
4	100	100	100	100	100	100	100
5	100	100	100	100	100	100	100
6	100	100	100	100	100	100	100
7	100	100	100	100	100	100	100
8	100	100	100	100	100	100	100
9	100	100	100	100	100	100	100
10	100	100	100	100	100	100	100
11	100	100	100	100	100	100	100
12	100	100	100	100	100	100	100
13	100	100	100	100	100	100	100
14	100	100	100	100	100	100	100
15	100	100	100	100	100	100	100
16	100	100	100	100	100	100	100
17	100	100	100	100	100	100	100
18	100	100	100	100	100	100	100
19	100	100	100	100	100	100	100
20	100	100	100	100	100	100	100
21	100	100	100	100	100	100	100
22	100	100	100	100	100	100	100
23	100	100	100	100	100	100	100
24	100	100	100	100	100	100	100
25	100	100	100	100	100	100	100
26	100	100	100	100	100	100	100
27	100	100	100	100	100	100	100
28	100	100	100	100	100	100	100
29	100	100	100	100	100	100	100
30	100	100	100	100	100	100	100
31	100	100	100	100	100	100	100
32	100	100	100	100	100	100	100
33	100	100	100	100	100	100	100
34	100	100	100	100	100	100	100
35	100	100	100	100	100	100	100
36	100	100	100	100	100	100	100
37	100	100	100	100	100	100	100
38	100	100	100	100	100	100	100
39	100	100	100	100	100	100	100
40	100	100	100	100	100	100	100
41	100	100	100	100	100	100	100
42	100	100	100	100	100	100	100
43	100	100	100	100	100	100	100
44	100	100	100	100	100	100	100
45	100	100	100	100	100	100	100
46	100	100	100	100	100	100	100
47	100	100	100	100	100	100	100
48	100	100	100	100	100	100	100
49	100	100	100	100	100	100	100
50	100	100	100	100	100	100	100
51	100	100	100	100	100	100	100
52	100	100	100	100	100	100	100
53	100	100	100	100	100	100	100
54	100	100	100	100	100	100	100
55	100	100	100	100	100	100	100
56	100	100	100	100	100	100	100
57	100	100	100	100	100	100	100
58	100	100	100	100	100	100	100
59	100	100	100	100	100	100	100
60	100	100	100	100	100	100	100
61	100	100	100	100	100	100	100
62	100	100	100	100	100	100	100
63	100	100	100	100	100	100	100
64	100	100	100	100	100	100	100
65	100	100	100	100	100	100	100
66	100	100	100	100	100	100	100
67	100	100	100	100	100	100	100
68	100	100	100	100	100	100	100
69	100	100	100	100	100	100	100
70	100	100	100	100	100	100	100
71	100	100	100	100	100	100	100
72	100	100	100	100	100	100	100
73	100	100	100	100	100	100	100
74	100	100	100	100	100	100	100
75	100	100	100	100	100	100	100
76	100	100	100	100	100	100	100
77	100	100	100	100	100	100	100
78	100	100	100	100	100	100	100
79	100	100	100	100	100	100	100
80	100	100	100	100	100	100	100
81	100	100	100	100	100	100	100
82	100	100	100	100	100	100	100
83	100	100	100	100	100	100	100
84	100	100	100	100	100	100	100
85	100	100	100	100	100	100	100
86	100	100	100	100	100	100	100
87	100	100	100	100	100	100	100
88	100	100	100	100	100	100	100
89	100	100	100	100	100	100	100
90	100	100	100	100	100	100	100
91	100	100	100	100	100	100	100
92	100	100	100	100	100	100	100
93	100	100	100	100	100	100	100
94	100	100	100	100	100	100	100
95	100	100	100	100	100	100	100
96	100	100	100	100	100	100	100
97	100	100	100	100	100	100	100
98	100	100	100	100	100	100	100
99	100	100	100	100	100	100	100
100	100	100	100	100	100	100	100

For all groups of people "C" in 1947-48 is 100.

TABLE 17

RECAPITULATION OF PERCENTAGES FOR TEST 3

<u>STUDENT</u>	<u>01-05</u>	<u>10-14</u>	<u>20-24</u>	<u>30-34</u>	<u>40-44</u>	<u>50-54</u>	<u>60-64</u>
1	100	100	90	86	85	91	92
2	100	117	115	110	103	106	99
3	100	98	93	96	96	107	117
4	100	131	115	111	111	121	127
5	100	116	106	106	101	92	96
6	100	101	103	102	111	112	122
7	100	71	93	90	87	91	87
8	100	105	78	108	88	108	88
9	100	104	99	105	99	99	94
"t" value		.760	.506	.230	.256	.609	.785

For seven degrees of freedom "t" is 2.365 at 5% level.

# TABLE 17

RECAPITULATION OF RECOMMENDATIONS FOR FISCAL YEAR 1961

RECOMMENDATION	10-10	10-11	10-12	10-13	10-14	10-15	10-16
1	100	100	100	100	100	100	100
2	100	111	110	110	110	100	100
3	100	100	100	100	100	100	100
4	100	111	111	111	111	111	111
5	100	110	100	100	100	100	100
6	100	100	100	100	100	100	100
7	100	100	100	100	100	100	100
8	100	100	100	100	100	100	100
9	100	100	100	100	100	100	100
10	100	100	100	100	100	100	100

For seven degrees of freedom "F" is 2.592 at 5% level.

# APPENDIX A

## Sample Calculation

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

$$\text{where } S_1^2 = \frac{1}{N_1 - 1} \left[ \sum X_1^2 - \frac{(\sum X_1)^2}{N_1} \right]$$

$$\bar{X}_1 = \frac{\sum X_1}{N_1}$$

$$S_2^2 = \frac{1}{N_2 - 1} \left[ \sum X_2^2 - \frac{(\sum X_2)^2}{N_2} \right]$$

$$\bar{X}_2 = \frac{\sum X_2}{N_2}$$

## Test 1

Student	Slopes		Percentages	
	01-05	10-14	01-05	10-14
1	.430	.434	0	1
2	.458	.475	0	4
3	.423	.438	0	4
4	.439	.502	0	14
5	.482	.521	0	8
6	.470	.435	0	-7
7	.541	.498	0	-8
8	.510	.481	0	-6
$\sum X$	3.753	3.784	0	10
$\bar{X}$	.469	.473	0	1.25
$(\sum X)^2$	14.085009	14.3186556	0	100



General Classification

$$\sqrt{\frac{\sum_{i=1}^n \frac{1}{x_i^2}}{n}} = \frac{1}{\sqrt{\frac{\sum_{i=1}^n x_i^2}{n}}}$$

where  $\frac{1}{x_i^2} = \frac{1}{x_i^2} - \frac{1}{x_i^2}$

$\frac{1}{x_i^2} = \frac{1}{x_i^2} - \frac{1}{x_i^2}$

Table 1

Frequency		Class		Cumulative
10-15	15-20	10-15	15-20	
1	0	.004	.000	1
4	0	.016	.000	5
8	0	.032	.000	13
12	0	.048	.000	25
16	0	.064	.000	41
20	0	.080	.000	61
24	0	.096	.000	85
28	0	.112	.000	113
32	0	.128	.000	145
36	0	.144	.000	181
40	0	.160	.000	221
44	0	.176	.000	265
48	0	.192	.000	313
52	0	.208	.000	365
56	0	.224	.000	421
60	0	.240	.000	481
64	0	.256	.000	545
68	0	.272	.000	613
72	0	.288	.000	685
76	0	.304	.000	761
80	0	.320	.000	841
84	0	.336	.000	925
88	0	.352	.000	1013
92	0	.368	.000	1105
96	0	.384	.000	1201
100	0	.400	.000	1301

	01-05	10-14	01-05	10-14
$\frac{(\sum X)^2}{N}$	1.760626	1.789832	0	12.5
$\sum X^2$	1.772319	1.797860	0	442.0
$S^2$	.001670	.001147	0	429.5
$\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}$		.019		2.746
$\bar{X}_1 - \bar{X}_2$		.004		1.25
$t$		.210		.455

01-01 02-02 03-03 04-04

0.11 0 0.11 0.11  
0.22 0 0.22 0.22  
0.33 0 0.33 0.33

0.44

0.44

0.55

0.55

0.66

0.66

0.11

0.22

0.33

0.44  
0.55  
0.66  
0.77  
0.88  
0.99

1.00

1.11

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